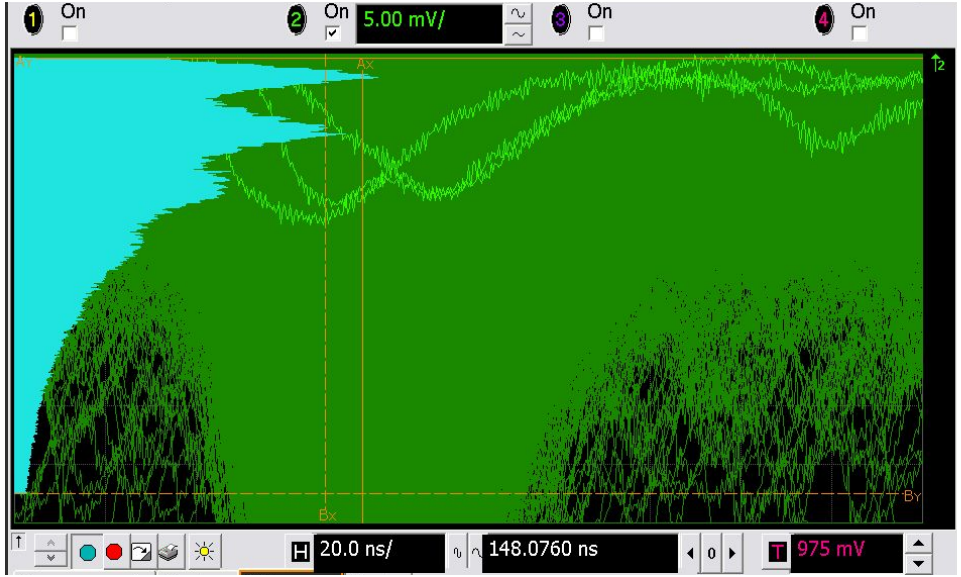
CU Boulder HCAL June 28 Update

Ron Belmont and Sebastian Vazquez

Recalibrated SiPM PE Spacing

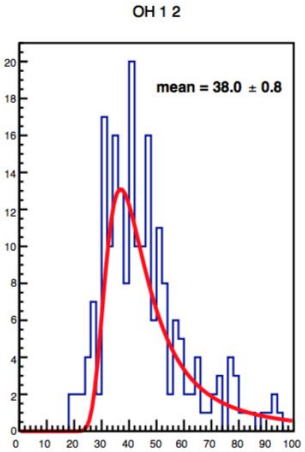


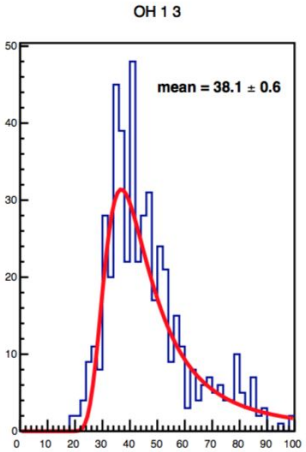
Photoelectron peaks are clearly visible and have a measured spacing ~ 5 mV/PE

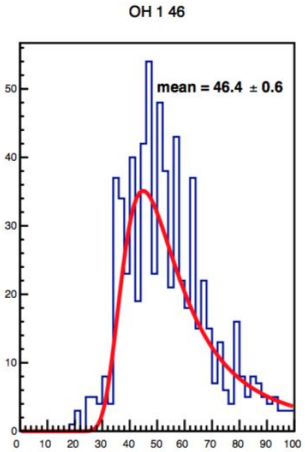
This is consistent with previous PE spacing measurements made on the same model SiPM

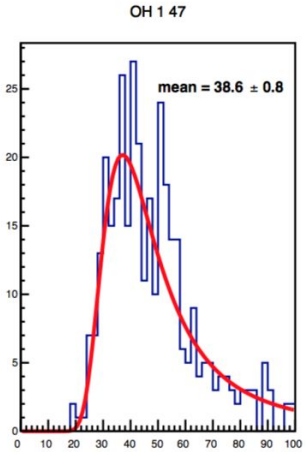
SiPM Serial: 3618 (from Oct shipment)

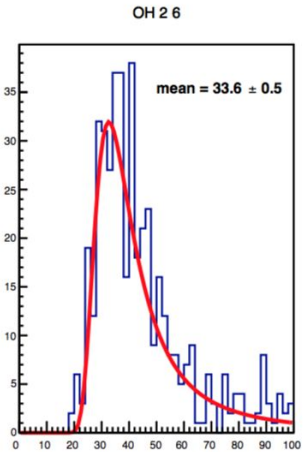
Cosmics Run With Oct SiPM (5mV/PE)

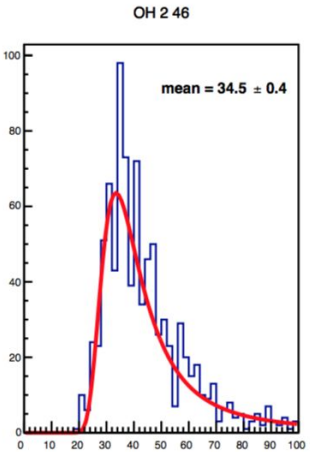


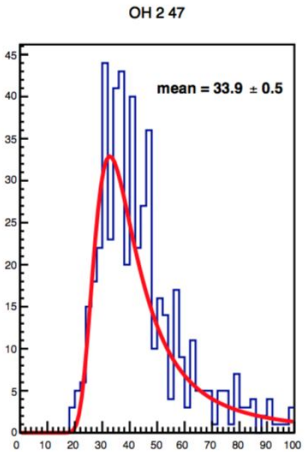


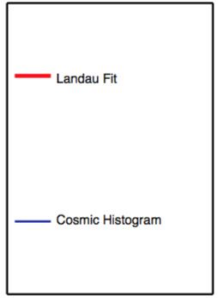


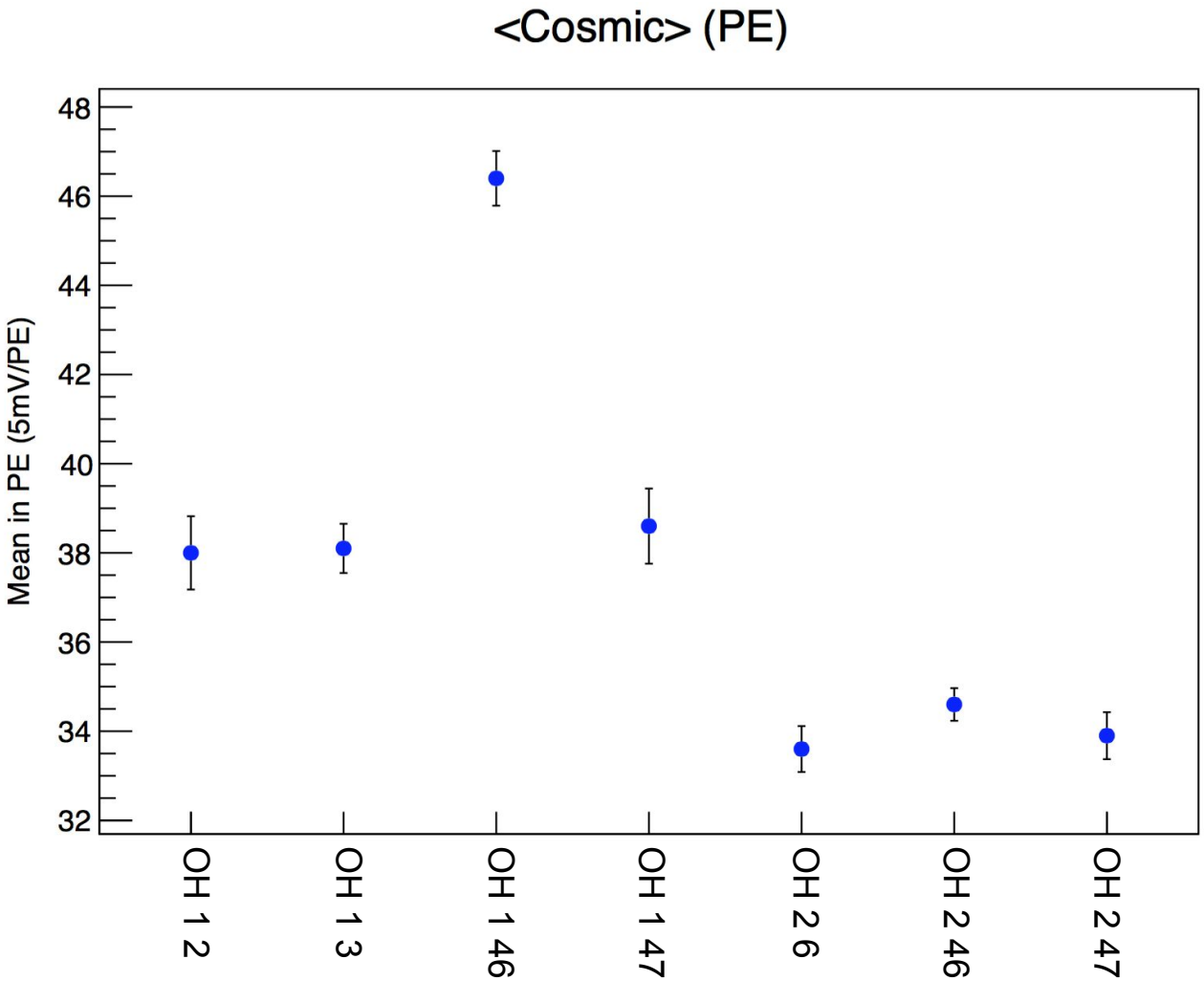




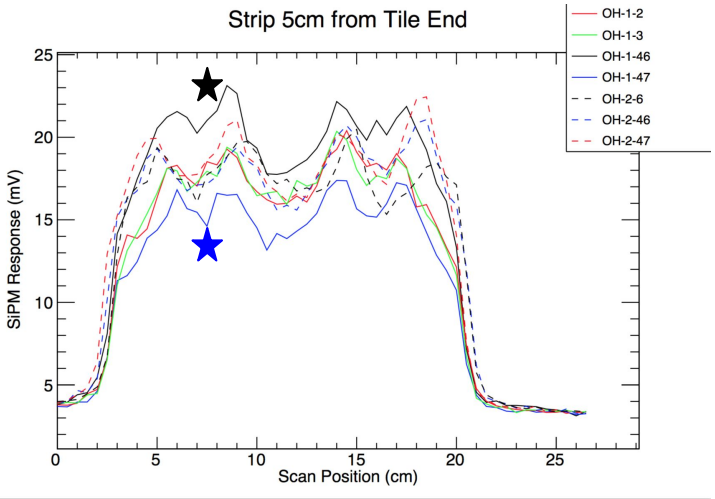


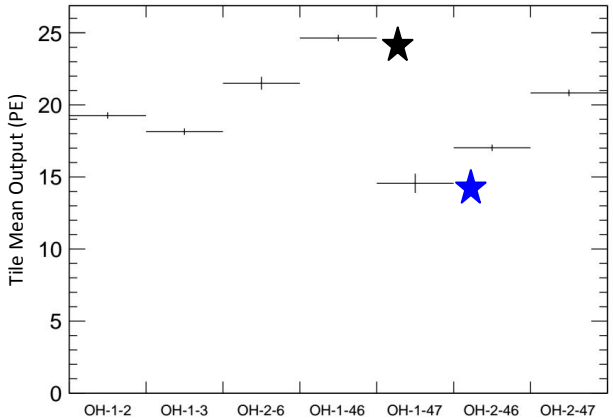





<Cosmic> (PE)
Mean in PE (5mV/PE)
48
46
44
42
40
38
36
34
32
OH 1 2
OH 1 3
OH 1 46
OH 1 47
OH 2 6
OH 2 46
OH 2 47

Rapid Uniplast HCAL Tile QC

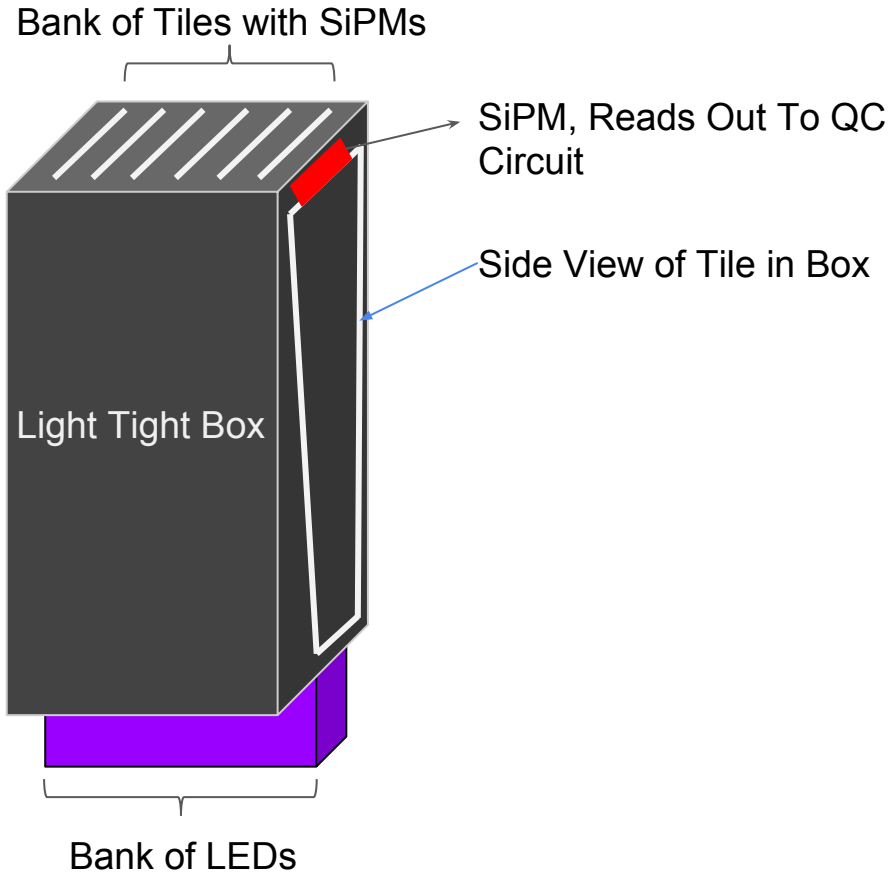




In tests run several months ago we compared the light collected along the inner edge of the tiles during the LED scans to the average response of each full panel. We saw that the general ordering of the tile's total luminosity was reproduced by just scanning the last centimeter of the tile.

This leads us to ask if one may perform a quick quality control check on each tile before it is wrapped by placing a bank of LEDs at the end of each panel and examining its response.

A Possible Prototype



- This light tight box would contain multiple unwrapped tiles each with their own LED.
- They would read out simultaneously to a comparison circuit that could get the mean light output from each tile.
- An arduino or raspberry pi could analyze the distribution and flag outliers for investigation/removal.

Up Next

- Are we still interested in investigating the possibility of using an LED along the edge of each panel to perform a quick quality control check and estimate the panel's average luminosity?
    - If so, we will place a bank of LEDs along the inner edge of a stack of plugged in panels and compare this to full LED scans and cosmics.
- We are waiting for high eta tiles to arrive from Brookhaven so we can start characterizing them.